THE EFFECTS OF VIDEO TECHNOLOGY ON PARENT-IMPLEMENTED FUNCTIONAL ANALYSIS

A Thesis submitted

in partial fulfilment of the requirement

for the Degree

of

Master of Arts in Psychology

by

Tatiana Igorevna Li

University of Canterbury

2011

Acknowledgements

I would like to thank my supervisors, Neville Blampied and Lawrence Walker for their support, expertise, and guidance throughout the year.

Thank you to all the families who participated, because without you this study would not have happened. I am also grateful to Autism New Zealand, Altogether Autism, and Children's Autism Foundation for their assistance.

To my loving parents for their constant encouragement and endless love, I am forever grateful. Thank you for giving me inspiration and support when I needed it the most!

A group of amazing people that showed me their support, love, and encouraged me to always look on the bright side of things, I am so happy to have you in my life. Katia, Maia, Ali, Branislava, Katarina, and Jovan, thank you for always being there, I am forever indebted.

Lastly, I would like to thank God for giving me the strength to accomplish this.

Tables of Contents

Page

Acknowledgements ii

List of Tables v

List Figures vi

Abstract 1

Introduction 2

Autism Spectrum Disorder and Problem Behaviours 2

Functional Behaviour Assessment 5

Indirect assessment 6

Direct observations 7

Functional analysis 8

Parent Training 11

Instructional video 14

Literature Review 18

Method 29

Participants and Settings 29

Child's target behaviour 31

Functional analysis conditions and participants' target behaviours 31

Data Collection and Reliability 34

Social Validity 34

Table of Contents cont **Page**

Experimental Design 35

Procedure 35

Results 39

Discussion 44

References 50

Appendices 59

A: Advertisement 59

B: Information Sheet 60

C: Consent Form 62

D: Functional Assessment Interview Form 63

E: Correct parents' responding Checklist 66

F: Satisfaction Questionnaire 70

G: Baseline reading material 72

H: Instructional DVD 73

I: Video view log 74

J: Knowledge quiz 75

List of Tables

Table **Page**

1. Summary of literature evaluating the effectiveness of training on functional analysis skill acquisition 19

2. Summary of participants' information 30

3. Description of correct responses for each functional analysis condition 33

4. Percentage correct responding for each functional analysis condition across participants during baseline, instructional DVD, feedback, and maintenance 42

5. Participants' correct behaviour recording percentages following training and during maintenance 43

List of Figures

Figure **Page**

1. Total number of available response instances and total number of correct responses for each functional analysis condition across participants in baseline, instructional DVD, feedback, and maintenance 41

Abstract

Past research has shown that following training, paraprofessionals can successfully implement a functional analysis, and that the skills learned can be maintained over time. However, little research has been done in the area of teaching parents how to conduct functional analyses. The present study examined the effectiveness of an instructional video and corrective feedback on the parents' ability to acquire functional analysis implementation skills.

Following the presentation of the instructional video, a slight increase in performance accuracy was observed for two of the participants. Performance feedback was required for all participants in order to elevate their correct responding frequency. Parents were also taught how to measure their child's problem behaviour using partial-interval recording. Results show that parents were able to record the child's behaviour following training with high accuracy.

Current findings further extend previous research by demonstrating the parents' ability to correctly conduct a functional analysis and correctly measure behaviour. Limitations of the current study and suggestions for future research are discussed.

INTRODUCTION

Autism Spectrum Disorder and Problem Behaviours

The Autism Spectrum Disorder (ASD) diagnostic group includes three classifications, namely, Autistic Disorder, Asperger's Disorder and Pervasive Developmental Disorders – Not Otherwise Specified (PDD-NOS; Boyd & Shaw, 2010), and is characterised by a triad of observable features. These include behavioural deficits in social awareness and interaction, deficits in verbal communication and language production, and behavioural excesses of stereotyped responses (American Psychiatric Association, 2000). These characteristics need to be seen before a child's third birthday in order to receive a diagnosis of autism (American Psychiatric Association, 2000; Boyd & Shaw, 2010).

Deficits in social interaction and awareness include failure to establish peer relationships, failure to recognise others' needs and emotions, and failure to identify nonverbal behaviours of others (e.g., body language). Impairments in communication and language production may include impairment in, or absence of, spoken language, failure to maintain conversations, and presence of echolalia (Neitzel, 2010; Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Individuals with ASD may also exhibit a series of stereotyped behaviours and interests. These could include preoccupation with an object, or parts of objects (e.g., cars, cartoon characters, numbers), stereotyped behaviours (e.g., hand flapping), obsessive compulsive behaviours, and insistence on sameness (e.g., taking the same route to school).

Because ASD is a spectrum disorder, individuals will display the above characteristics to varying degree of severity, duration and topography, and these are likely to change over time within an individual (Boyd & Shaw, 2010). For example, failure to establish peer relationships may, over time, develop into difficulty in maintaining personal relationships.

In New Zealand, approximately 1 person in every 100 is diagnosed with ASD (Autism New Zealand Inc., 2010). Results from the 2006 report released by the Centers for Disease Control and Prevention showed that the prevalence of autism in America is approximately 1 in 110 children, an increase of around 57% from 2002 (Rice, 2009). Additionally, Fombonne (2003) has noted that, compared to figures from 30 years ago, the prevalence of ASD is at least 3 times higher.

A number of factors have contributed to the substantial increase in prevalence, including improvement in diagnostic tools and increase in public awareness of ASD (Steyaert & De La Marche, 2008; Vokmar et al., 2004). Over the past 20 years, the diagnostic criteria has broadened its definition of ASD and has included classifications such as Asperger's Syndrome and PDD-NOS, both of which lie on the higher functioning end of the autism spectrum (Boyd & Shaw, 2010; Fombonne, 2003). Increased prevalence rates can also be attributed to the growth in public knowledge of ASD. Public awareness of the symptoms and characteristics that are associated with the disorder may result in greater, and earlier, diagnosis (Boyd & Shaw, 2010).

Although the primary cause of autism still remains unclear, research has identified several factors that may be associated with ASD. The sex of a person plays a crucial role; males are 4 times more likely to be diagnosed with autism than females (American Psychiatric Association, 2000). Several environmental issues, such as moderate mercury exposure, parental age, and maternal immigration, may also contribute to the susceptibility of autism (Rutter, 2011). There is also a strong genetic component associated with ASD, and thus the disorder is thought to be congenital (Bailey et al., 1995; Rutter, 2011; Szatmari, 2003).

Many children who are diagnosed with ASD may exhibit some form of problem behaviour (Neitzel, 2010). Before descriptions and examples of problem behaviour are given, it is important to first define the term 'problem behaviour'. Doss and Reichle (1991) defined

challenging/problem behaviour as "behaviour emitted by a learner that results in self-injury, or injury to others, causes damage to the physical environment, interferes with the acquisition of a new skill and/or socially isolates the learner" (p. 215).

Delays in communication, social skills and language development could be seen as triggers for the development of problem behaviours in children with ASD (Buschbacher & Fox, 2003; Neitzel, 2010). Neitzel (2010) summarises the most common types of problem behaviours that are displayed by children with ASD. The author groups these behaviours into two categories: repetitive, stereotypical or restrictive behaviours, and disruptive behaviours.

Repetitive behaviours include stereotypies (i.e., repetitive movement or utterance), echolalia (i.e., repetition of word, phrase or noise), and difficulties with change (e.g., insistence on sameness). Self-injury, tantrums, aggression towards others, and destruction of property are all classified under disruptive behaviours.

Such problem behaviours range in their degree of intensity, duration, and appearance between individuals. It is also possible that the extent may differ within an individual. For example, a child may whine and moan when a demand is given to him by his mother, but may scream and kick when the same demand is placed on him by his father.

Problem behaviours are viewed as socially inappropriate, difficult to manage and can be dangerous to self and others (McDonnell et al., 2008; O'Reilly et al., 2010). Consequently, problem behaviours may interfere with academic learning, present limited social interaction, and decrease quality of life for both the individual and their family (Cale, Carr, Blakeley-Smith, & Owen-DeSchryver, 2009; Machalicek, O'Reilly, Beretvas, Sigafoos, & Lancioni, 2007; O'Reilly et al., 2010).

Researchers have also found a relationship between a child's problem behaviour and parental stress (Cale et al., 2009). Higher emotional burnout is experienced by teaching staff

when they are faced with problem behaviours that they cannot effectively deal with (Machalicek et al., 2007).

Because of the consequences that problem behaviours may have, these behaviours must be treatment priorities. If ignored, problem behaviours may continue to persist and escalate (Murphy et al., 2005). Interventions should focus on eliminating problem behaviour by either reducing its frequency, duration and magnitude, or by teaching alternative appropriate behaviours.

In order for the interventions to be successful, research shows that prior functional assessment of variables that are evoking and maintaining problem behaviours is ideal (Cale et al., 2009; O'Reilly, et al., 2010).

Functional Behaviour Assessment

Any behaviour, whether it is appropriate or inappropriate, serves a specific function for an individual, including positive, negative, and automatic reinforcements.[1] However, the function of behaviour can sometimes be difficult to establish because different topographies of problem behaviour may have the same function; or, single behaviour topography can serve a number of different purposes (Iwata, Kahng, Wallace, & Lindberg, 2000 in Austin & Carr). For example, in order to receive attention from a teacher, a child may call out their name, refuse to do an activity or try to escape from the classroom. Additionally, a child's tantrum can be a result of exhaustion, an attempt to escape a difficult situation, or a tactic used to gain a specific reinforcer.

Functional Behaviour Assessment (FBA) consists of three different classes of method that have been designed to help identify specific environmental variables that could be

[1] Reinforcement that is not socially mediated, such as sensory stimulations (e.g., self-injurious behaviour of head banging to reduce a headache)

maintaining problem behaviour (Arndorfer & Miltenberger, 1993). The three methods of Functional Behaviour Assessment are indirect assessment, direct observation, and functional analysis (Arndorfer & Miltenberger, 1993; Cooper, Heron, & Heward, 2007).

Indirect assessment

Behavioural interviews, questionnaires, checklists and rating scales, comprise the indirect assessment method, and are used in order to obtain information about possible maintaining variables of problem behaviour. Individuals who participate in these assessments include family members, caregivers, staff, and teachers of the person who displays the problem behaviour (Arndorfer & Miltenberger, 1993).

Indirect assessments may be relatively easy and brief to carry out, can be done in any setting, and can help to discover further information not only about the problem behaviour but also about possible antecedent and consequent events. However, the reliability of such methods is arguable (Cooper et al., 2007). Such methods rely on the respondents' past recollections of the problem behaviour and therefore can be biased and incorrect (Lennox & Miltenberger, 1989, as cited in Arndorfer & Miltenberger, 1993).

Previous research has shown low reliability figures for indirect assessment methods (Barton-Arwood, Wehby, Gunter, & Lane, 2003; Conroy, Fox, Bucklin, & Good, 1996; Zarcone, Rodgers, Iwata, Rourke, & Dorsey, 1991). Barton-Arwood and colleagues (2003) evaluated the intra-rater reliability of Motivation Assessment Scale (MAS) and Problem Behaviour Questionnaire (PBQ). They found that reliability was inconsistent for both assessments and that the scores decreased over time for the MAS.

Due to the poor reliability results from previous research, results and information gained from indirect assessments should not be used alone to identify functional relation between problem behaviour and environmental variables (Cooper et al., 2007).

Direct observations

Methods used in direct observations help identify the time of occurrence and frequency of target behaviour, as well as other environmental events that precede and follow the target behaviour (Arndorfer & Miltenberger, 1993). Techniques used in direct observations include scatter-plot analysis (Sloman, 2010; Touchette, MacDonald, & Langer, 1985) and antecedent-behaviour-consequence (A-B-C) assessments (Bijou, Peterson, & Ault, 1968; Sloman, 2010).

The rate of problem behaviour and the time it occurred in naturalistic setting is recorded on a scatter-plot graph (Touchette et al., 1985). A certain pattern can then emerge after a few days of observations. For example, a scatter-plot can show specific times of the day when the problem behaviour is more likely to occur, or whether specific environmental variables, such as people or activities, correlate with the frequency of problem behaviour.

During the A-B-C assessment the occurrence of target behaviour and the environmental events that immediately precede and follow this behaviour are recorded (Cooper et al., 2007). A-B-C assessment recordings can be achieved in two ways. In continuous recording, a predetermined checklist of possible antecedents, consequences and target behaviours is used during observations (Cooper et al., 2007; Sloman, 2010). The list of possible events is created using the information gained from previously completed functional interviews and questionnaires. Unlike continuous recording, the data gathered using the narrative technique is open-ended (Cooper et al., 2007). That is, an observer records every occurrence of problem behaviour and the relevant events that precede and follow it.

Direct observations are helpful in gaining information regarding the time of occurrence and frequency of problem behaviours, as well as identifying the naturalistic events that precede and follow these behaviours. Additionally, they are useful when the target behaviour is dangerous or has extremely low occurrence frequency (Sloman, 2010). However, direct

observations require more training than indirect assessments (Lennox & Miltenberger, 1989), and are more time consuming (Arndorfer & Miltenberger, 1993). Furthermore, results from direct observations alone should not be used to form functional relationships between environmental events and problem behaviour due to the correlational nature of the observations (Lennox & Miltenberger, 1989; Sloman, 2010).

Lerman and Iwata (1993) examined the extent to which a direct observation method would produce similar outcomes to a more strenuous experimental analysis. The results showed that data obtained from direct observations was inconsistent with the data gained through experimental analysis. Furthermore, conclusions made from the data about possible maintaining variables of problem behaviour were varied between the two methods. Other research has discovered similar results (Pence, Roscoe, Bourret, & Ahearn, 2009; Thompson & Iwata, 2007), suggesting that results obtained from direct observations should be considered with caution.

Functional Analysis

Functional analysis (also referred to as experimental analysis) involves direct and systematic manipulation of antecedents or consequences in the environment in order to gain information about functional relationship between behaviour and environment (Cooper et al., 2007).

Carr and Durand (1985) identified possible situations which maintained behaviour problems in four children with developmental disability. They manipulated two antecedents, task difficulty and frequency of adult attention, and found that low levels of adult attention and the more difficult tasks occasioned problematic behaviour (Carr & Durand, 1985). Previous researchers have also found functional relations using a number of antecedent manipulations, including task duration and task instruction (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991) and ecological variables (Horner, 1980).

Consequences can also be manipulated in a functional analysis. Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) conducted a study in which they introduced a model to help determine possible functions of self-injurious behaviour. In this method, four standard experimental conditions (Alone, Attention, Demand, and Play) are presented in sequential order. In the Alone condition, the subject is placed in a room in which no leisure items or people are present. During the Attention condition, the subject is in a room with the 'experimenter'. Leisure items and toys are within easy reach of the subject. Attention is given to the subject upon every instance of target behaviour. The experimenter ignores all other behaviour that the subject displays. In Play condition, the experimenter and the subject are in the same room. Leisure items are available and attention is given to the subject at least every 30 seconds. Inappropriate behaviour and target behaviour are ignored. An appropriate educational task or activity is presented to the subject in the Demand condition. The task chosen is one that the subject finds difficult in completing. The experimenter presents the educational task to the subject using a three-prompt procedure (i.e., verbal prompt, model prompt, and physical prompt). That is, if the subject does not respond to verbal instruction within 5 seconds, the experimenter then models the correct response. If the subject is still not responsive, the experimenter then physically guides the subject to complete the response, and a new trial begins. Despite the prompts used, social praise is given on completion of the task. The trial ends immediately on every occurrence of target behaviour.

Data collected during the four experimental conditions provide information about possible variables maintaining the target behaviour. For example, if high rate occurrences of behaviour are observed during the Alone condition, the maintaining variable is most likely automatic (sensory) reinforcement. If high occurrences are observed during Attention condition then it is likely that behaviour is maintained by social attention. Behaviour that is maintained by escape from tasks will have a high-rate of occurrence during the Demand condition. Few or

no problem behaviours should occur during the Play condition, as this condition provides an "enriched environment" (Iwata et al, 1982/1994, p. 203) and serves as a control condition. The information from functional analyses can then be used for designing and implementing effective interventions for problem behaviours.

Previous research of functional analysis has predominantly used the method described by Iwata et al. (1982/1994), and only a few studies employed the Carr and Durand (1985) assessment of antecedent manipulation (see Hanley, Iwata, & McCord, 2003, for a review of functional analysis literature). Compared to indirect and descriptive assessments, functional analysis can clearly demonstrate, due to its controlled environment, a functional relationship between specific variables and behaviour (Cooper et al., 2007). Furthermore, Iwata, Vollmer, and Zarcone (1990) suggested that the Control condition, during which low levels of problem behaviour should be observed, can provide an immediate management technique with high intensity self-injurious behaviours.

One disadvantage of using functional analyses is that there is a possibility that a new reinforcement contingency could be established for the problem behaviour during the functional analysis (Iwata et al., 1990). Several researchers have proposed variations of the methodology to address the above issue. For example, Northup et al. (1991) have successfully illustrated the use of a brief functional analysis to identify maintaining variables of aggression in 3 patients with mental retardation. The brief analysis consisted of four analogue conditions similar to those described by Iwata et al. (1982/1994) and Carr and Durand (1985), and lasted between 5 and 10 minutes each, with a short break in between sessions. Total number of sessions for each individual did not exceed 7. Furthermore, a contingency reversal phase of the condition which showed the highest percentage of aggressive behaviour followed the conclusion of analogue conditions. During this phase, a manding response was modelled at the start of the condition, and specific consequences were contingent upon this response. The

results showed evidence for the use of a brief functional analysis as an assessment tool of contingencies maintaining aggressive behaviour and treatment utility (Northup et al., 1991).

Another study demonstrated the use of a discrete-trial approach for functional analysis to determine whether aggressive behaviour was maintained by either attention, access to tangibles or task avoidance (Sigafoos & Saggers, 1995). The subjects were two boys diagnosed with autism who showed some form of aggressive behaviour. The functional analysis consisted of 20 discrete-trials for each of the three conditions over a period of five days. Each discrete-trial consisted of two parts, lasting up to 60 seconds each. In the first part the condition specific reinforcer was contingent upon aggression; during the second part the same reinforcer was available continuously. Authors reported a clear demonstration that a discrete-trial approach was able to isolate specific variables associated with aggressive behaviour for both subjects (Sigafoos & Saggers, 1995). Furthermore, this type of brief functional analysis was easily incorporated into a natural school environment.

Traditional functional analyses also require professional expertise and are lengthy to complete (Cooper et al., 2007; LaRue et al., 2010). In spite of this, previous studies have explored the ability to train lay individuals to assist in the implementation of functional analysis (English & Anderson, 2004; Iwata, Wallace et al., 2000; Moore et al., 2002; Phillips & Mudford, 2008; Wallace, Doney, Mintz-Resudek, & Tarbox, 2004). All studies showed that after training individuals (i.e., caregivers, teachers, and students) were able to perform functional analysis conditions.

Parent Training

Because parents tend to spend majority of the time with the child, and in a number of different situations and environments (Matson, Mahan, & LoVullo, 2009), they are ideal 'candidates' for behaviour skills training. Training parents who have children with autism to

implement behavioural techniques may be beneficial. It may help them to understand their child's progress and development, improve inter-family relationships, and it can be cost and time effective for both the family and therapists (Matson, Mahan, & LoVullo, 2009). By learning behavioural techniques, parents can also be involved in their child's therapy, which in turn can help children feel secure and familiar within their environment.

Previous research has shown that parents can acquire skills to implement a number of behavioural techniques, including discrete-trial teaching (Murzynski & Bourret, 2007), script-fading (Reagon & Higbee, 2009), the high-P procedure (Humm, Blampied, & Liberty, 2005) and, picture exchange communication system (Ben Chaabane, Alber-Morgan, & DeBar, 2009).

Some of the more frequent methods that are used in training literature include role-play, modelling, feedback, instructional procedures, and a combination of different methods (Hansford, Zilber, LaRue, & Weiss, 2010; Jahr, 1998). During role-play an instructor demonstrates the skills to a student, while the student acts as the client. After which, the student and the instructor switch roles, giving the student an opportunity to practice the recently shown techniques with the instructor. During modelling, the instructor demonstrates the required procedures first, and then the student has the opportunity to perform the same procedures with a client. Feedback, in either oral or written format, is usually presented with the above procedures, and is seen as a form of evaluation of the students' performance (Jahr, 1998).

The instructional procedures encompass a number of materials which could include written manuals, oral presentations, lectures, and instructional videos (Jahr, 1998). These methods can be presented either live or through video technology, and can be presented to a big audience or just a single person at a time. One of the commonly used training procedures in literature is the combination of different methods (Jahr, 1998). It involves the use of different types of instructional approaches together, some of which are mentioned above (Jahr, 1998).

Different training techniques have their advantages, especially when it comes to the type of skill set to be learned. Flanagan, Adams, & Forehand (1979) trained forty-eight parents how to use the time-out procedure with their young children. Parents received one of four training techniques: lecture presentation, written material, videotape modelling, and role-play. The efficacy of the four techniques was assessed, and results showed variations among the methods. Compared to the control group, all four methods were superior in their effectiveness to convey information to parents (Flanagan et al., 1979).

The authors also suggest that different instructional techniques should be used depending on what the instructor wishes to covey (Flanagan et al., 1979). For example, if the purpose of the training is so that the skills can be utilised at home, written instructions should be avoided. Instead, modelling was seen as the most effective method for generalising the skills to the home environment (Flanagan et al., 1979).

To evaluate the success of a training programme, several issues should be considered (Jahr, 1998). First, the skills learned should be evident in situations other than in which they were trained (i.e., learned skills should be able to generalise to other clients and settings). Second, the procedures taught should contribute to positive changes in client behaviours. Finally, acquired skills should be maintained for longer period of time following the withdrawal of training.

Furthermore, to ensure that training programs are successful they should be effective, efficient, and acceptable (Parsons, Reid, & Green, 1996). Specifically, training programs are effective when high performance accuracy is observed in trainees, and when an improvement in client behaviours is evident following the application of trainees' acquired skills. To be successful, training should also be cost and time efficient, and be socially valid.

Earlier research on functional analysis skill acquisition employed training programs which involved a multi-element content, including written instructions, role-play, live and/or

video modelling, assistance and verbal feedback (Iwata, Wallace, et al., 2000; Moore et al., 2002; Moore & Fisher, 2007; Phillips & Mudford, 2008; Skinner, Veerkamp, Kamps, & Andra, 2009; Wallace et al., 2004). Although these studies have successfully taught individuals how to implement functional analysis, there is a need to improve the cost and time effectiveness of such training programs (Collins, Higbee, & Salzberg, 2009; Trahan & Worsdell, 2011). One way to do this is to use instructional videos (Collins et al., 2009; Moore & Fisher, 2007; Trahan & Worsdell, 2011).

Instructional video

Albert Bandura first introduced observational learning in the 1970s (Bellini & Akullian, 2007). Observational learning is described as the cognitive and behavioural change that occurs when a person observes others doing similar actions (Bandura, 1986). Bandura showed that children were able to acquire a range of skills by observation alone (Bellini & Akullian, 2007).

Stemming from Bandura's early work, the concept of modelling was introduced (Sherer et al., 2001). Modelling is viewed as the process in which a person (i.e., the model) illustrates a set of behaviours which can then be replicated by the observer (Dowrick, 1991, p.65). Models can be either live or, filmed and presented through video technology. Video modelling can be used as a training method to teach individuals a range of skills. Instead of using a multi-component training programme (e.g., combination of live and video modelling, instruction manuals and role-plays), instructional videos can be created.

The history of instructional television started with live broadcasts back in the 1950s (Caspi, Gorsky, & Privman, 2005). The introduction of new and relatively inexpensive technologies and equipment, has improved the availability, presentation, and production of instructional videos (Buzhardt & Heitzman-Powell, 2005; Caspi et al., 2005). Due to these

developments, researchers compared the efficacy of instructional videos as a training tool with other training methods.

Macurik and colleagues evaluated three features of video training versus live training as components of a training program for teaching support staff to implement behaviour plans for individuals with problem behaviours (Macurik, O'Kane, Malanga, & Reid, 2008). In particular, they measured the effectiveness (i.e., staff skill acquisition), efficiency (i.e., training time), and acceptability (i.e., training satisfaction) of both video and live training. Participants were randomly divided into two groups, one receiving the initial training in live sessions, while the other group watched a training video. Effectiveness of training was measured by a written knowledge quiz and on-the-job observations. The efficiency measure was the amount of training time involved, while the measure for acceptability was an anonymous satisfaction questionnaire which included questions about the likeness and helpfulness of the training.

Results showed that both video and live training were equally effective in training support staff to implement behaviour intervention plans with clients. The group that received video training scored slightly higher for on-the-job performance than the live training group, however, the difference was not significant. Watching the video was more efficient than live training, although the authors argue that the time spent creating the video should also be taken into account. Results concerning the acceptability of the training procedures showed that, although, video training was rated highly acceptable, live training was always rated slightly higher. Authors suggest that overall results tend to support the usefulness of using video as a training method compared with live training for training the implementation of behaviour intervention plans (Macurik et al., 2008).

Another recent study examined the effectiveness of video-based versus print-based instructional materials in teaching practical skills to distance learners of a Block-Laying and

Concreting course (Donkor, 2010). Students were randomly assigned into two groups, with one group receiving video-based instruction, while the other group received print-based material. Once the training concluded, participants were asked to complete a multiple-choice test and a practical exam. Results showed that the two groups acquired similar scores on the multiple-choice test, indicating similar levels of theoretical knowledge gained. However, the video-based instruction group obtained significantly higher amount of practical skills, and displayed superior craftsmanship, than the written-based instruction group (Donkor, 2010).

Taken together, results from the above studies support the benefits of using instructional video as a training tool, and demonstrate that high levels of both theoretical and practical skills can be gained through such instruction. The use of videos has also been successful in teaching a number of different skills to different individuals (e.g., Catania, Almeida, Liu-Constant, & Digennaro Reed, 2009; Collins et al., 2009; Neef, Trachtenberg, Loeb, & Sterner, 1991; Shipley-Benamou, Lutzker, & Taubman, 2002). Shipley-Benamou and colleagues taught three children with autism daily living skills using video modelling (Shipley-Benamou et al., 2002). Videotapes were constructed depicting the implementation of each task from the participant's point of view. Results showed that children were able to acquire the skills and maintain them at a 1-month follow up.

More recently, Catania and colleagues have successfully used video modelling to train direct-service staff to conduct discrete-trial sessions (Catania et al., 2009). Participants were able to maintain and generalise skills with a high degree of accuracy.

Due to the availability of increasingly affordable software and technology, instructional videos are now seen as cost effective, can be distributed in a number of different ways, and are easily duplicated (Carr & Fox, 2009; Neef et al., 1991). In addition, videos are portable and can be used with both visual and aural learners (Torrence, 1985).

Previous research has shown that lay individuals can acquire a number of behavioural techniques after sufficient training. However, only a number of researchers taught individuals, and specifically parents, how to conduct functional analysis. Following is a review of the relevant studies, and the rationale for the present research.

LITERATURE REVIEW

Relevant Literature

Since the introduction of functional analysis methodology (e.g. Iwata et al., 1982/1994), several researchers have tried to teach individuals the essential skills needed to conduct functional analysis independently. Table 1 is a summary of current studies that have evaluated the effects of training on functional analysis skill acquisition. Studies were identified using the following electronic databases: PsychINFO and EBSCOhost, using the keywords *functional analysis, functional assessment,* and *staff training*. The reference section of each article from the search was then examined to identify additional articles on functional analysis skill training.

To assess the amount of training that is necessary for obtaining functional analysis skills, Iwata, Wallace, et al. (2000) taught eleven upper-level undergraduate students how to implement a functional analysis. Training was presented in 2 phases. The first phase was conducted in a group format and included written summaries and videotape simulations of the three functional analysis conditions (attention, demand and play). Participants were given a short answer quiz at the end of the phase, and had to score above 90% correct on the quiz to move onto the second phase of the training. During the second phase, participants were asked to conduct the three conditions in a fixed repeating sequence of attention, play and demand. These were simulated sessions in which participants acted as therapists, and eight graduate students played the role of a client using different scripts. Correct implementation of the conditions involved the delivery and removal of prescribed antecedents and consequences relative to the client's behaviour, and was expressed as a percentage of correct therapist's responses. Participants had to score at or above 95% implementation accuracy; otherwise they were shown a videotape of their sessions and given feedback on their performance. This continued until participants completed two consecutive sessions of each condition at or above 95% accuracy.

Table 1

Summary of literature evaluating the effectiveness of training on functional analysis skill acquisition

Study	Participants	Clients	Exp. design	Dependent Variable	Training program	Length of training	FA conditions	Maintenance/ Generalisation	Results
Iwata, Wallace, et al. (2000)	11upper-level undergraduate students	8 graduate students	Multiple baseline across subjects (simulated assessment)	% of correct therapist responses	Group format, written summaries, videotaped simulations, written quiz, feedback	Approximately 2 hours	Fixed repeating sequence of Attention, Play and Demand	None	All improved following training. Baseline performance generally high; several participants showed upward trends during baseline
Moore et al. (2002)	3 elementary school teachers	3 male students (1 diagnosed with specific learning disabilities; 2 appeared to be developmentally normal). All referred for inappropriate yelling during class	Multiple baseline across subjects (simulated assessment)	% of correct teacher responses	Written & verbal information, role-play, performance feedback	Not provided	Attention and Demand	Classroom probes with clients	Each teacher's accuracy improved (means exceeding 95%)
Wallace et al. (2004)	2 teachers, school psychologist	Actor who engaged in body hitting using scripts	Multiple baseline across participants (simulated assessment)	% correct responding	Group format workshop which included videotaped demonstrations and role-play; feedback for Participant 3	3-hr workshop	Attention, Demand, and Toy-play	Participant 1: classroom probe with a student 12 weeks after workshop	Participants 1&2 scored above 96%; Participant 3 needed feedback for demand; 100% during generalisation probes

Study	Participants	Clients	Exp. design	Dependent Variable	Training program	Length of training	FA conditions	Maintenance/ Generalisation	Results
Moore & Fisher (2007)	3 participants with BA in psychology (1 pursuing MA in behaviour analysis)	Simulated sessions: experimenter played the client using scripts Natural sessions: actual clients with self-injurious behaviour	Multiple baseline across subjects. Different treatment components evaluated using features of multi-element design	% correct responses emitted	Written material, lecture training, video modelling (complete vs. partial)	Not provided	Attention, Demand, Play	Baseline and follow-up probes with actual clients	Lecture-only training: below mastery criterion of 80% Partial-video: moderate increase Complete video: clear improvements Participant 3 required post-session feedback for Play
Phillips & Mudford (2008)	4 residential staff members	2 residents (male and female) with profound intellectual disabilities	Multiple baseline across participants	% correct responding	Verbal & written information, live modelling, role-play, and feedback	60-100 minutes	Fixed repeating sequence of Alone, Attention, Play, Demand	Participant 4: on completion of training with different behavioural topography	Performance increased following training. Participant 3 required within-session prompt for Attention & Demand
Stokes & Luiselli (2008)	2 sets of parent who had a child with autism	2 children with autism Simulated assessment: graduate student played the client using a script	Multiple baseline across participants	Number of correct implemented intervals (as a %)	Video modelling, flow chart, verbal & written feedback, video feedback	Approximately 30 minutes	Attention, Demand, and Play	Each participant conducted 1 condition (chosen randomly) with their child at the final session	Performance increased after verbal & written feedback; further improvements following video feedback. All participants scored 100% during child probe

Trahan & Worsdell (2011)	2 groups of college students (undergraduates and graduates)	Trained graduates played the role of a client with challenging behaviour (using scripts)	Multiple baseline across subjects	% correct implementation of prescribed antecedents & consequences	Instructional DVD & pamphlet, quiz, feedback	Approximately 120 minutes	Fixed sequence of Attention, Tangible, Demand, No Interaction, and Play	None	Undergraduates: accuracy improved after DVD; all needed further feedback to reach criterion (90%) Graduates: baseline accuracy higher than undergraduates; after DVD all improved accuracy for at least 3/5 conditions; all needed further feedback to reach criterion

All participants improved their implementation accuracy following training, indicating that untrained individuals acquired the basic competences for implementing functional analysis conditions. However, baseline data were rather high (M = 69.9%) with a great deal of variability. Authors also noted an upward trend during baseline for several participants, and should have continued to take data until the trend stabilised. Furthermore, participants used in this study may have been previously exposed to behavioural theories as part of their coursework, thus making the baseline data rather high and acquiring functional analysis skills with ease. Because performance was assessed under simulated conditions, and no generalisation data with actual clients was presented, it is unknown whether the participants were able to implement functional analyses to the same degree of accuracy under natural settings. Finally, the absence of maintenance data gives little insight to whether the learned skills can be maintained over time with no further training.

To extend the findings of Iwata, Wallace, et al. (2000), another study looked at training elementary school teachers the use of functional analysis methods (Moore et al., 2002). Two functional analysis conditions, attention and demand, were taught to three elementary school teachers who had limited experience in behaviour-analytic techniques. All training was conducted in the teacher's classroom during a planning period, and involved the use of written and verbal information regarding the conditions, live modelling, role-play, and performance feedback. During training, teachers implemented the two conditions, while a graduate student played the role of a client. Teachers' behaviours were scored as correct or incorrect based on the occurrence and non-occurrence of the client's behaviour. The percentage of correct teacher responses was calculated by dividing the correct number of responses by the total number of opportunities for teacher's behaviour, and multiplying it by 100. After training, all teachers conducted classroom probes with students who yelled out inappropriately during class. Classroom probes took place during on-going instruction, and teachers were given feedback after every session.

Low performance accuracy was observed following the initial training (i.e. after the presentation of written and verbal material). Once teachers received feedback, and had a chance to role-play the conditions, performance dramatically improved, and exceeded 95% accuracy for all teachers. Performance during classroom probes continued to show high levels of integrity. Results clearly showed teachers' ability to correctly implement the two functional analysis conditions, under simulated and in-class instruction. However, because only two conditions were taught and implemented, there is no confirmation that elementary school teachers can implement a full functional analysis. Unlike the study conducted by Iwata, Wallace, et al. (2000), participants generalised their skills to real clients, but the absence of maintenance data still fails to illustrate whether these skills can be maintained.

Both of the studies mentioned above have mainly used a one-to-one instructional training with the participants. Such methods use a lot of the trainer's time, especially if the number of trainees is large. Wallace and colleagues, on the other hand, analysed the effectiveness of a workshop-training format (Wallace et al., 2004). The workshop provided the participants with a description and purpose for each of the condition, a videotaped demonstration, and a chance to role-play both the client and therapist. Participants in this study were two teachers and a school psychologist who attended a 3 hour workshop on functional analysis with approximately 35 other individuals. Simulated analyses of three functional analysis conditions (attention, demand, and toy-play) were conducted after the conclusion of the workshop, and data on correct delivery of prescribed antecedents and consequences was collected for each participant. If a participant failed to implement a condition with at least 90% accuracy, he/she was provided with verbal feedback on their performance.

During baseline, performance accuracy was low across the participants, and no one scored above 50% correct. Two of the participants scores increased to over 96% accuracy after workshop training, however, one participant required feedback after he failed to meet the criteria (i.e. 90% accuracy) for the demand condition. Additionally, one participant conducted functional analysis,

with 100% accuracy, in her classroom 12 weeks after the workshop with a student who engaged in head hitting.

Unlike the two previously mentioned studies, results here show that functional analysis skills can be maintained at 12 weeks and generalised to natural setting after training. In addition, generalisation data for the remaining two participants would have strengthened this conclusion. Authors note that participants may have represented a highly motivated group, as they were not randomly chosen. However, one of the participants needed additional performance feedback after failing to reach the mastery criterion of 90% or above during the demand condition. This result may also suggest that the demand condition requires a more complex set of steps to be remembered, unlike the other two conditions.

To further extend previous findings, Phillips and Mudford (2008) assessed whether residential caregivers can be trained in functional analysis methodology. All four of the functional analysis conditions, namely alone, attention, demand and play, were taught to four staff of a residential care facility. Although Iwata and colleagues (2000) stated that the alone condition does not need to be trained because it does not require the presence of a therapist, Phillips and Mudford (2008) argued that understanding how to correctly arrange the environment for the alone condition would be a useful skill for assistants conduction functional analyses.

Training consisted of a multi-component program which included a verbal and written explanation of the four conditions, live modelling, rehearsal using role-play, and corrective feedback at the end of each role-play. Role-plays were repeated until the participant scored at least 95% correct responding. Feedback was also provided following each trial during the assessment phase. All of the training and assessment sessions were conducted with two residents of the facility.

Results were consistent with previous research, and all participants improved their performance following training. One participant required within-session prompting for attention and demand conditions in order to reach the mastery criterion of 95% correct responding. Skills generalised to a different behavioural topography of the same client when one participant conducted

functional analysis at the end of training. However, like previous studies, no maintenance data was taken. Furthermore, authors note that the integrity measure (percentage correct responding) was not a sensitive enough measure, and failed to take into account sessions when no opportunities for responding were present (i.e. participants seemed to obtain 100% accuracy).

Having caregivers, rather than therapists, conduct functional analyses can help identify more precise contingencies that occasion and help maintain problem behaviours (Stokes & Luiselli, 2008). Previous studies have successfully trained paraprofessionals, and results showed that majority were able to implement functional analyses with a high degree of integrity after training. Stokes & Luiselli (2008) intended to extend previous literature, and examine the effectiveness of a home-based training program on functional analysis skill acquisition with two sets of parents who had a child with autism.

All sessions were conducted in a small area in each family's home. During training, a graduate student played the role of the child, using scripts. Three functional analysis conditions were taught: attention, demand and play. Training consisted of video modelling, flow chart of the required steps, and verbal and written feedback. Participants also received video feedback, in which they viewed a video of themselves conducting the three conditions, and received performance feedback. Correct implementation of the conditions was recorded using a 30s partial-interval recording method. Implementation accuracy was calculated by dividing the number of intervals in which correct consequences were demonstrated by the total number of intervals in which client's target behaviour occurred, multiplied by 100.

Parents showed high performance accuracy following training. Video feedback increased parents' performance to nearly 100% accuracy. Parents were also able to generalise the skills with their own children, however, no maintenance was conducted. Additionally, parents only performed one of the conditions during the generalisation probe. Thus, it is unknown whether other conditions can be generalised to the same degree of accuracy. Study also relied heavily on therapists' time.

Although the training was carried out during a 1-week period, parents received numerous number of feedback sessions.

One way to reduce one-to-one training time, and ultimately reduce costs, is to use videotapes during training. Moore and Fisher (2007) examined the effectiveness of videotapes as a training tool, by comparing videotapes containing a multiple number of therapist behaviours with those containing a limited number, on functional analysis skill acquisition. Like previous studies, a multiple baseline across participants design was used, with features of multi-element design evaluating the different treatment components.

Three individuals with BA degrees, one of who was pursuing a master's degree in behaviour analysis, participated in the study. Attention, demand, and play conditions were taught and implemented during both simulated and natural sessions. Natural baseline and follow-up probes were conducted with actual clients who displayed self-injurious behaviour. During the simulated sessions the experimenter played the role of a client using scripts. Procedural integrity was calculated by dividing correct responses by total possible opportunities, and multiplying it by 100. Training material consisted of PowerPoint® presentation, written materials, and video modelling (partial vs. complete videos). Each condition was randomly assigned to receive one of the instructional methods (e.g. attention received lecture only, demand received partial video, and play received complete video).

The most effective instructional strategy appeared to be video modelling with multiple exemplars, followed by partial video modelling and lastly, lecture training. Although all participants achieved mastery criterion, one participant required post-session feedback for the play condition. Follow-up data clearly shows that skill acquisition transferred to actual clients, but the study failed to examine maintenance of skills. Furthermore, the mastery criterion was set at 80% correct responses, unlike previous studies which all had above 90% criterion.

Recently, Trahan and Worsdell (2011) examined the effectiveness of a commercially available instructional DVD on acquisition of functional analysis skills. Unlike previous studies,

five functional analysis conditions were assessed, and presented in a fixed sequence of attention, tangible, demand, alone, and play. Two groups of students, upper-level undergraduate and masters-level students, participated. During simulated sessions data was collected on the frequency of correct and incorrect responses, summarised as percentage correct implementation. The instructional DVD was given to students to take home and view, and the following day they implemented the five conditions. If they failed to reach a mastery criterion of 90% accuracy, they were given verbal feedback and role-played correct responses. Feedback phase continued until the mastery criterion was met for all five conditions in one series. Results showed that none of the participants reached the mastery criterion following the exposure to the DVD, and all required further feedback. Baseline data for both groups had a great deal of variability, and was higher for graduate students. This suggests that previous exposure of coursework for graduate students may have facilitated skill acquisition. Absence of maintenance and generalisation data fails to demonstrate the participants' ability to transfer the learned skills to actual clients following training. However, the use of an instructional DVD may have minimised the cost and time of training, and future investigations are needed to see if caregivers can implement functional analysis to the same degree as paraprofessionals following similar training.

Summary of literature

It is clear to see from the results of previous literature that lay individuals are capable of acquiring functional analysis skills after training. Although these are just a sub-set of skills needed to independently carry out a functional analysis, such skills are useful for trainees and caregivers because they can be trained to assist behaviour analysts in their work. Most studies reviewed have used paraprofessional individuals, with exception of Stokes & Luiselli (2008), who have used parents as participants. Knowledge of functional analysis methods can give an insight to parents about their child's behaviours. It can also save future costs and time for the family, if they are able to assist behaviour analysts in their work.

To minimise the cost and time effectiveness of training, for both the parent and therapist, instructional videos have been useful as training tools (Moore & Fisher, 2007; Trahan & Worsdell, 2011). Advantages of instructional videos include ease of use and availability. They are also easily duplicated and are portable. Further research, however, is needed to examine the effectiveness of instructional videos on parent-implemented functional analysis.

Lack of maintenance data fails to identify whether the acquired skills can be subsequently maintained by the trainees. Although Wallace and colleagues (2004) illustrated high implementation accuracy 12 weeks after training, data was only taken for one participant.

Rationale of current research

The aim of the current research is to extend the finding of previous literature and examine the effectiveness of using an instructional video on skill acquisition of functional analysis methodology in parents of children with ASD. Maintenance data will be gathered for all participants 6 weeks after the training completion. The training program is designed so that parents, once trained, are better able to assist behaviour therapists in the performance of functional analysis as part of designing and implementing behavioural interventions.

METHOD

Participants and Settings

Participants were recruited with the help from Autism New Zealand Inc., Altogether Autism, and Children's Autism Foundation. These three organisations provide support, resources, and information to individuals diagnosed with ASD and their caregivers. An advertisement was circulated to the members of these organisations via e-mail and newspapers (see Appendix A). A take-home copy was also available for attendees of a seminar presentation by Professor Peter Dowrick.[2]

Participants were included in the study if they 1) had no previous knowledge or experience in functional analyses; 2) had a child who was younger than 13 years; 3) the child was diagnosed with ASD; and 4) the child displayed problem behaviour(s) that interfered with his/her learning. Four parents were recruited as participants, however, one parent dropped out after a few sessions due to other commitments. Therefore, only 3 parent-child dyads completed the study.

Description of each participant is outlined in Table 2. All participants held a Master's degree, and had no previous training in conducting functional analyses. Each participant attended an EarlyBird® programme delivered by Autism New Zealand Inc., the aim of which is to provide caregivers information about autism, and help them to manage their child's behaviour and facilitate communication. Two of the participants were Chinese, and had English as their second language. All participants were married, and were primarily responsible for their child's therapy.

Prior to the commencement of the study, participants were given an Information Sheet (see Appendix B) which provided a brief description of the proposed research, an estimated

[2] Seminar presentation titled 'Thinking in Pictures, Creating Futures on Video: *including* children and adults with autism' was presented at the University of Canterbury on October 4, 2010.

Table 2
Summary of participants' information

Participant	Age	Sex	Ethnicity	First Language	Family size	Highest education completed	Previous training in ABA/FA	Child's characteristics
Participant 1	46	Female	New Zealand European	English	6	Master's degree	EarlyBird® programme (Autism NZ); Books (e.g. Kazdin); no training in FA	Male, 8 years old, diagnosed with Asperger's Syndrome. *Problem behaviours*: noncompliance to instruction, rude remarks to authority figures, meltdowns, minor property destruction *Therapy/Treatments:* Social skills and turn-taking training with special needs teacher
Participant 2	40	Male	Chinese	Mandarin	3	Master's degree	EarlyBird® programme (Autism NZ); heard of FA but no knowledge of methodology	Male, 3 years old, diagnosed with autism. *Problem behaviours:* Tantrums, noncompliance *Therapy/Treatments:* Relationship Development Intervention, Gluten & Dairy Free diet, Speech Language Therapy, Floor-time therapy
Participant 3	36	Female	Chinese	Mandarin	4	Master's degree	EarlyBird® programme (Autism NZ); exposure to ABA through child's therapy; books; no training in FA	Male, 4 years old, diagnosed with mild/moderate autism. *Problem behaviours:* loud squealing; biting/licking objects *Therapy/Treatments:* ABA (5 months), Speech Language Therapy, Gluten & Dairy Free diet

timeline, assurance of privacy, and their right to withdraw at any time. Participants were also required to sign a Consent Form (see Appendix C), in which they gave permission for video recording and publication of the collected data.

All sessions were conducted in the participants' homes, in either the living room or the child's bedroom. The researcher assumed the role of a trainer for the duration of the research, and was present during all sessions.

Child's target behaviour

After receiving the written consent, the researcher met with each participant to gather information about their child's problem behaviours using a Functional Assessment Interview Form (see Appendix D; adapted from O'Neill et al., 1997). After this was completed, descriptions of the child's target behaviour were developed. Target behaviour for Participant's 1 child was noncompliance, defined as: 1) negative statements/vocalisations (e.g., "No", "Never", "I don't want to"); 2) running away; 3) questions/comments unrelated to the task at hand; and 4) removal of task materials. Participant's 2 child's target behaviour was tantrums, and was described as: 1) showing a sad face; 2) whining; 3) screaming; or 4) crying. The target behaviour for child of Participant 3 was squealing, defined as high-pitch sounds.

The above descriptions of target behaviours were used for the duration of the study, with the exception of Participant's 1 child, whose target behaviour was different during the generalisation probe.

Functional Analysis conditions and participants' target behaviours

Data were collected on the participants' correct and incorrect presentation of antecedents and consequences during the four functional analysis conditions. Table 3 outlines and describes the correct responses for each condition. Additionally, data were collected on participants' correct recording of their child's behaviour from videotapes, using a partial-

interval recording method (Cooper et al., 2007). Each session lasted 5 minutes, and was videotaped by the trainer for the purpose of data collection and feedback.

Conditions were presented in a fixed sequence of Alone, Attention, Play, and Demand. Because Participant's 1 child's target behaviour required the presence of another person to occur, the Alone condition was removed. Therefore, assessment sequence for Participant 1 was Attention, Play, and Demand.

During the Alone condition, the child was placed in the room alone, with no access to leisure materials. The parent either walked out of the room and partially closed the door, or moved as far away from the child as possible (i.e., if sessions were conducted in the living room with no doors). If the child tried to escape from the room, the parent physically escorted the child back into the room and closed the door for a brief moment. No interaction or eye contact was made with the child during this condition.

In the Attention condition, the child had access to leisure materials throughout the session. At the beginning of the session, the parent instructed the child to play and then moved to another side of the room and worked (e.g., cleaned the room or read a book). Attention was provided to the child contingent upon every instance of the target behaviour. All other behaviours, whether appropriate or inappropriate, were ignored.

Absence of demands and access to leisure materials was available during the Play condition. The parent delivered attention approximately every 30 s, or if the child exhibited appropriate behaviour. Both target and inappropriate behaviours exhibited by the child were ignored.

During the Demand condition the parent presented the child with an educational task which the parent chose and which was within the child's skills repertoire, but which the child still had not mastered. Tasks included tying shoe laces, drawing, throwing and catching a ball. A verbal instruction to do the task was presented at the beginning of the session. If the child did

Table 3

Description of correct responses for each functional analysis condition

FA condition	Antecedent	Correct Consequence	Definition
Alone	Start of session	Removal of stimulating material	Material that may serve as a source of stimulation for the child must be removed from the room
		Child is placed alone in the room	No other person is present
Attention	Start of session	Availability of leisure items	Free access to leisure items and toys
		Instruction given	Initial instruction is given (e.g. "Play with the toys while I do some work")
		Move Away	Parent moves away from the child and pretends to be busy (e.g. reading a magazine)
	Target behaviour	Reprimand/Concern	Statement of concern and/or reprimand is given (e.g. "Please stop that, you will hurt yourself")
		Physical Contact	Brief physical contact is displayed (e.g. Response block or hand on child's shoulder)
	Other behaviour	Ignore	All other behaviour exhibited by the child is ignored
Play	Start of session	Access to leisure materials	Free access to leisure items and toys
		Absence of demands	No demands are placed on the child by the parent
	Approximately every 30sec	Non-contingent attention	Frequent attention is given to the child (at least every 30sec). Could be either a social praise (e.g. "Wow, you are playing very nicely") or brief physical contact (e.g. hand on shoulder)
	Target behaviour	Ignore	Occurrence of target behaviour is ignored
	Appropriate behaviour	Attention	Attention is given contingent upon occurrence of appropriate behaviour (e.g. asking for help)
	Inappropriate behaviour	Ignore	Inappropriate behaviour that is not the target behaviour is ignored
Demand	Start of session	Task stimuli are presented in front of the child	The task stimuli are placed where the child can see and reach them
	Presentation of task	Verbal instruction	Initial verbal task instruction is given (e.g. "Do the puzzle")
	Noncompliance to verbal instruction	Verbal instruction + model prompt	If the child has not responded to verbal prompt after 5sec, instruction is repeated coupled with a model prompt of child's correct response
	Noncompliance to model prompt	Verbal instruction + physical prompt	If the child has not responded to model prompt after 5sec, instruction is repeated coupled with physical guidance to complete child's correct response
	Correct task responding	Social praise + next task	When task is completed (either alone or with prompt), social praise is given and next task is introduced
	Target behaviour	Trial termination	Trial is terminated for 30sec contingent upon occurrence of target behaviour
	Other behaviour	Ignore	All other behaviour that is exhibited by the child is ignored

not comply with the instruction within 5 s, the parent repeated the instruction and modelled the correct response. If the child did not comply with the model prompt within 5 s, the parent repeated the instruction and physically guided the child to complete the task. Once the child completed the task, with or without the prompt, the parent praised the child and began the trial again. Trial termination occurred upon every instance of target behaviour, during which the parent removed all task materials and turned away from the child for 30 s. All other behaviour displayed by the child was ignored.

Data Collection and Reliability

Participants' behaviour was scored, from the videotaped sessions, as either correct or incorrect responding by using a checklist (see Appendix E). The checklist provided a list and description of behaviours that participants should emit. Each session was divided into 10 s intervals, signalled by a CD during the sessions. Frequency of total correct responding was recorded and compared to the total number of responding instances available.

Interobserver agreement on occurrence and non-occurrence of parents' correct and incorrect responding was obtained on 24 % of sessions with an independent observer. Agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements, and multiplying by 100%. The mean agreement was 80.8% (range, 62.5% to 100%).

In order to identify the percentage of correct behaviour recording by the parent, agreement on the participants' and trainer's recording of child's behaviour was also obtained using the above method.

Social Validity

At the conclusion of the study, participants' completed a Satisfaction Questionnaire (see Appendix F). The questionnaire contained 14 statements related to the components of the

training (i.e., instructional video and feedback), and overall satisfaction with the training. A Lickert-type scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*) was used to evaluate participants' opinions, with lower scores representing training acceptability. An opportunity for further comments was also provided.

Experimental Design

A single-subject, multiple-probe design across participants was used to evaluate the effects instructional video alone, and with additional feedback, has on the participants' correct implementation of the four analysis conditions.

Additionally, the study evaluated the degree to which parents can correctly measure their child's behaviour using a partial-interval recording method.

Procedure

Before commencing the study, participants were required to answer a short questionnaire containing demographic questions, and information on any previous exposure to functional analysis and other behavioural interventions.

Baseline Participants were given written material based on the method section of Iwata et al. (1982/1994) article to read 10 minutes prior to the commencement of baseline sessions. This material outlined the four conditions of functional analysis, namely Alone, Attention, Play, and Demand (see Appendix G). Written material was available for participants to review before each condition, and definitions of child's target behaviour were provided. Participants were then told to implement each of the conditions with their child to the best of their ability. No other information or feedback was provided. All materials required for each condition (e.g., educational task materials, leisure materials, etc.) were available for participants' use.

Training 1: Instructional DVD An instructional video was compiled, in which the researcher and a child actor demonstrated correct simulated implementations of the four functional analysis conditions (see Appendix H). The video also included a voice-over which described each condition and its purpose. In addition, the video illustrated how to correctly record instances of child's behaviour using partial-interval recording procedure. The video provided an opportunity to practice behaviour recording, and several partial-interval recording sheets were supplied with the DVD. The video also encouraged participants' to practice the techniques and take notes.

Parents were given the DVD to take home for a week. They were required to use a video view log (see Appendix I) to record how many times during the week they viewed the video, which chapters of the video they viewed, and whether they watched it alone or with someone else. No correspondence was made between the trainer and the parent during that week.

Assessment 1 After a week, the trainer met with a participant, collected the video view log and the DVD, and asked the participant to complete a short paper quiz (Appendix J). The quiz was designed to test the participants' understanding of the video's content.

Subsequently, the trainer asked the participant to conduct the four functional analysis conditions with their child using the information learned from the video. They were encouraged to view their notes (if they made any), and were told which condition will take place. No further instruction or feedback was provided, and all materials necessary for each condition were available for participant's use.

Following the implementation of functional analysis conditions, the trainer showed the participant a previously recorded baseline session. The parent and experimenter

independently recorded the child's target behaviour from the taped baseline session using a partial-interval recording procedure.

Training 2: Feedback At the next scheduled day following Assessment 1 (range, 1 to 5 days), the feedback phase was introduced. During this phase the trainer showed the participant the recorded video of Assessment 1 sessions and pointed out correct and incorrect instances of behaviour, while stopping and rewinding the video when necessary. Participants were encouraged to take notes. Afterwards, any differences between the trainer's and parent's behaviour recordings of the child were discussed. Any questions regarding the functional analysis conditions and partial-interval recording were answered.

Assessment 2 After feedback was delivered, participants were asked to implement each analysis condition based on the information they have gained through the video and feedback. Participants were given the opportunity to review their written notes prior to implementing each condition. The trainer informed the participant the order of the conditions. No other instruction was given, and all materials were available for participant's use.

Subsequently, both the trainer and the participant independently recorded the child's behaviour from one of Assessment 1 sessions.

Maintenance/Generalisation A maintenance probe occurred 6 weeks after the conclusion of training to assess the extent to which participants' behaviour maintained over time. Maintenance sessions were similar to those during the baseline phase. Participant 1 conducted the maintenance phase with different target behaviour of the child, to assess the extent to which skills generalised to different behaviour topography. The target behaviour for the child was rudeness, defined as: 1) offensive or impolite comments (e.g., "You are so boring", "Shut up", "Leave me alone"); 2) offensive or impolite body language (e.g., sticking out the tongue at an individual). Furthermore, the order in which the conditions were performed changed to Demand, Attention, and Play.

After implementing the functional analysis conditions, Participant 3 also recorded the child's behaviour from one of the Maintenance sessions using a partial-interval recording method.

RESULTS

Participants' frequencies of correct responding compared to the total number of available responding instances for each functional analysis condition is displayed in Figure 1. The percentage of correct responding during the four analysis conditions for each participant is shown in Table 4.

Baseline performance was generally low for both Participant 1 and Participant 2 during the functional analysis conditions (i.e., below 50% correct responding). However, during the Play condition Participant 1 scored 12 correct responses out of the available 13. Participant 3 implemented three of the four conditions with high accuracy during baseline, and either scored 100% correct responding (in the Alone condition), or only incorrectly performed one response (in the Attention and Play conditions).

Participant 1 viewed the instructional video once; Participant 2 watched the video three times; and Participant 3 viewed the video twice. Participant 1 and 2 answered all the questions of the quiz correctly, while participant 3 received 75% correct.

After viewing the instructional DVD, performance for Participant 1 increased across all conditions. Although performance during Demand condition improved slightly compared with the baseline data it remained low at 56% accuracy. Participant 2 also improved their performance after watching the DVD, although accuracy level was still low. The Alone condition was terminated early and was not repeated for the rest of the study because the frequency of the child's behaviour was rising and causing distress for both the parent and the child. Surprisingly, performance accuracy for Participant 3 decreased and fell below 50% for three of the four conditions following the presentation of an instructional DVD.

All three participants increased their frequency of correct responding for most of the conditions after receiving performance feedback. The exception was the Play condition for Participant 2, during which performance slightly decreased compared with performance during

the previous phase. Furthermore, although performance during the Demand condition increased, the level of correct responding was still low, unlike the Attention condition in which the participant scored 10 out of 11 responses correct.

Following feedback, Participant 1 implemented the Attention and Alone conditions with 100% accuracy, and only a slight increase in performance was observed for the Demand condition. Participant 3 scored 100% correct responding during three of the four conditions, and the performance for the Demand condition was slightly lower, at 71% accuracy.

The maintenance stage occurred at 6 weeks following the conclusion of training. Only Participant 3 maintained their performance at the same level of accuracy for the Alone and Attention conditions, and increased performance to 80% accuracy during the Demand condition.

Performance decreased across all conditions for Participant 1, who completed the maintenance phase with a different target behaviour for the child. Additionally, accuracy for Participant 2 slightly decreased during the Demand condition; however, Participant 2 attained 100% correct responding for the Play condition.

Partial-interval recording

In addition to correctly implementing functional analysis conditions, the participants' ability to correctly record behaviour using a partial-interval recording method was assessed. Percentage correct recorded following training and during maintenance is shown in Table 5.

All participants achieved high percentage accuracy following the Instructional DVD, with Participant 1 obtaining 100% accuracy. Following feedback Participant 1 increased their recording accuracy; Participant 2 maintained the same accuracy, while the accuracy of Participant 3 decreased slightly, but was still high at 90%. Furthermore, Participant 3 managed to increase their accuracy to 100% during maintenance.

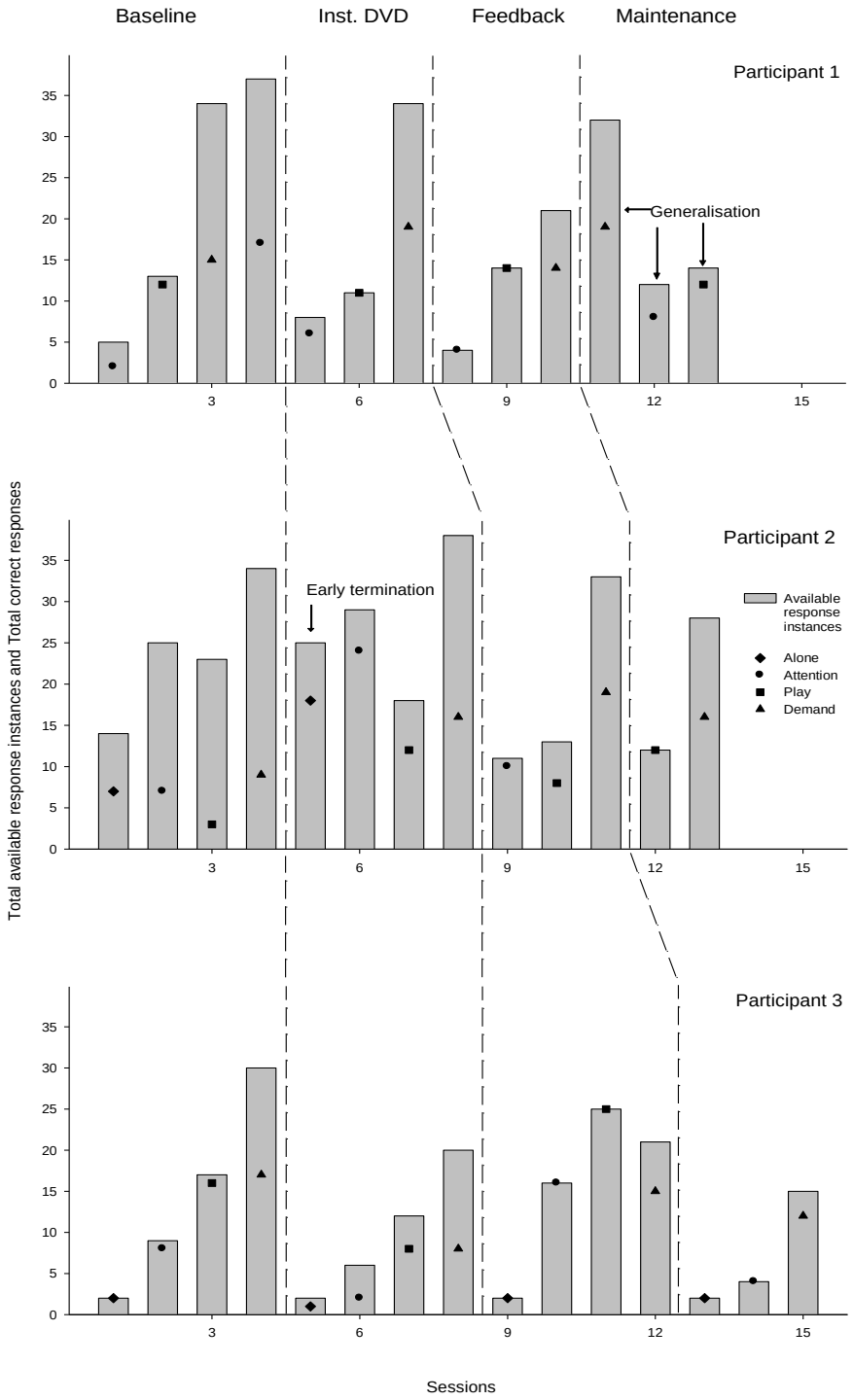

Figure 1
Total number of available response instances and total number of correct responses for each functional analysis condition across participants in baseline, instructional DVD, feedback, and maintenance

Table 4

Percentage correct responding for each functional analysis condition across participants during baseline, instructional DVD, feedback, and maintenance

FA Condition	Baseline (%)	Inst. DVD (%)	Feedback (%)	Maintenance (%)
Participant 1				
Attention	40	75	100	66.67 $^{+}$
Play	92.3	100	100	85.71^{+}
Demand	44.12	55.88	66.67	59.38^{+}
Participant 2				
Alone	50	72*	-	-
Attention	28	82.76	90.91	-
Play	13.04	66.67	61.54	100
Demand	26.47	42.11	57.88	57.14
Participant 3				
Alone	100	50	100	100
Attention	88.89	33.33	100	100
Play	94.12	66.67	100	-
Demand	56.67	40	71.43	80

Note.

$^{+}$ Generalisation with different child's target behaviour; different sequence order (Demand, Attention, Play)

- No data taken

* Session terminated early

Satisfaction Questionnaire

Overall, results from the satisfaction survey were positive (M = 2.4). One of the participants negatively scored their experience with the training (M = 3.6). This participant thought that as a parent their own insight into their child's problem behaviour is "more reliable and finely tuned". However, the parent learned that problem behaviour could arise as a result of avoiding tasks/people, and thought that was helpful for further understanding their child's behaviour.

Table 5

Participants' correct behaviour recording percentages following training and during maintenance

Assessment phase	**Participant 1**	**Participant 2**	**Participant 3**
Instructional DVD	86.67 %	93.33 %	100 %
Feedback	96.67 %	93.33 %	90 %
Maintenance	-	-	100 %

Note. - No data taken

DISCUSSION

The present study examined the effectiveness of an instructional DVD and corrective feedback as a method for training parents of children with autism to implement a functional analysis. Taken together, the results indicate great variability in performance across and within participants. Two of the participants improved their accuracy following the presentation of an instructional DVD. However, performance feedback was required to elevate correct responding for all participants, and only Participant 3 maintained the skills at the same level of accuracy over time. Results suggest that, with minimal training, parents of children with autism are able to acquire skills to carry out a functional analysis, although the durability of the acquired skills may be low.

These results are similar to those reported by Trahan and Worsdell (2011), who showed that, although accuracy increased following the presentation of an instructional DVD, further performance feedback was needed to reach a 90% accuracy criterion for both undergraduate and graduate students. Furthermore, their baseline data also displayed a great deal of variability between and within participants.

The current results are also comparable with another study which trained 3 teachers how to implement behavioural interventions based on prior functional analyses (DiGennaro-Reed, Codding, Catania, & Maguire, 2010). Training consisted of individualised video modelling, depicting different behavioural interventions, and verbal feedback. Following video modelling, teachers' performance increased slightly from baseline, but remained variable. All participants required further performance feedback in order to increase procedural integrity to 100%. Additionally, both training approaches were rated positively, however, video modelling plus verbal feedback were viewed more socially acceptable ((DiGennaro-Reed et al., 2010).

Previous research has successfully shown that paraprofessionals can be trained to correctly implement functional analyses (Iwata, Wallace, et al., 2000; Moore et al., 2002;

Phillips & Mudford, 2008; Wallace et al., 2004). Participants in these studies were individuals either working in the field of special education, or studying towards a degree in behaviour analysis. Although no pre-screening test was administered to participants in order to assess their understanding of behaviour analytic concepts, it is likely that these individuals may have acquired some knowledge of from previous coursework or work experience (Trahan & Worsdell, 2011). This could be a possible explanation of why Participant 3 in the current study had high implementation accuracy during baseline. Although the parent received no specific training in functional analysis, they were exposed to applied behaviour analysis through their child's therapy.

The current study extends previous literature in a number of ways. Because most of the time children interact with their parents, and usually in a number of different situations (Matson et al., 2009), parents play a crucial part in the child's learning and behaviour management. Teaching parents functional analysis skills can help them understand more about environmental factors that are maintaining their child's behaviour and, give them an active role in their child's therapy.

Only one other study has examined functional analysis skill acquisition in parents (Stokes & Luiselli, 2008). Training in that study involved a number of components, including video modelling, a flow chart, written and verbal feedback. In addition, training and assessment was carried out under simulated sessions, during which a graduate student played the role of the child. In order to increase the time and cost effectiveness of the training programme, the present study used an instructional DVD and verbal feedback. Because the content of instructional videos is standardised, it helps to increase the internal reliability[3] of

[3] Internal reliability refers to the consistency of the measure. That is, the extent to which the measure produces same results when presented systematically (Cooper, et al., 2007)

the training programme, in turn strengthening the comparisons between participants (Morgan & Salzberg, 1992).

As suggested by Phillips and Mudford (2008), to reduce the number of sessions that may be required in order to test for generalisation, real clients were used in the current study. Some authors have argued that using real clients during functional analysis may create a new reinforcement contingency for problem behaviour and may put the child and the parent at risk (Iwata, et al., 1990). Although these cautions are important, the children in the present study exhibited low frequency problem behaviours, and the trainer was able to terminate the session if the child or the parent showed signs of distress or put themselves in danger. Furthermore, sessions lasted 5 minutes, and there was a short break between each assessment condition.

Previously the procedural integrity of functional analysis implementation was reported as percentage correct responding. Phillips and Mudford (2008) found that this measure was not sensitive enough to take into account situations in which participants had no opportunity to respond. In addition to stating percentage correct responding, the current study also reported the frequency of participant's correct responding relative to the total number of available occurrences for responding. This provides a finer-grained and less distorted analysis for a better understanding of participants' ability to respond correctly to antecedents and consequences during a functional analysis.

The current study also assessed parent's ability to correctly record their child's problem behaviour during an analysis condition by using partial-interval recording method. Accuracy of recording was high across all participants, suggesting that parents can accurately measure behaviour using a partial-interval recording method. These results are a similar to previous research which illustrated that lay individuals can be trained to use direct observation methods to correctly record behaviour (Bass, 1987; Wilkinson, Parrish, & Wilson, 1994).

The findings of the current study should be viewed with caution. Several limitations exist and are subsequently described. As previously mentioned, performance accuracy during baseline was high for one of the participants. A written pre-test should have been administered to all participants prior to baseline, in order to test their knowledge of underlying principles of applied behaviour analysis and functional analysis. This would confirm that all participants had entered baseline with the same level of knowledge and experience in functional analysis.

It would have been preferable to continue taking baseline data for the participant who achieved high accuracy, to see if they could maintain their performance without any additional training. However, this was not possible because the number of baseline and assessment sessions was determined prior to the commencement of the study due to tight schedules of both the trainer and the parents. Furthermore, one of the participants had planned to attend an introductory course on applied behaviour analysis, and this could have interfered with the results.

Performance accuracy during the Demand condition was the lowest among all the assessment conditions. Trahan and Worsdell (2011) reported similar results and suggested that variations in accuracy may have resulted because of possible differences in complexity levels of the conditions. That is, the number of antecedents and consequences to be delivered is different for each condition. Whereas the Alone condition required the parent to place the child in the room alone with no distracting materials, and leave the door slightly ajar; the Demand condition required more complex steps to be executed in order to reach a high performance accuracy. Such differences between conditions are inherent in standard functional analysis procedures, and this suggests that training for those who are to perform functional analyses needs to focus on training competence for the most difficult conditions, rather than allocate equal training time and resources to the different conditions.

The current study failed to demonstrate maintenance and generalisation to another behavioural topography of the child for one of the participants. Past research has shown that residential staff members are able generalise the skills and conduct functional analyses with a different behavioural topography of a client (Phillips & Mudford, 2008). Further research is needed to establish whether the same outcome can be achieved with parents. Since there is little reason to suppose that parents and residential staff are inherently different in their capacity to learn or perform functional analyses, such research should focus on those aspects of training known to enhance generality and maintenance of skills, such as training in the natural environment (Ducharme & Fieldman, 1992) and teaching general, rather than task-specific, behavioural techniques (Cowart, Iwata, & Poynter, 1984).

Although parents were able to correctly measure their child's problem behaviour from video tapes and implement four functional analysis conditions with high accuracy following training, the skills taught are not representative of a full functional analysis. For example, parents were not taught how to identify and define target behaviours, how to interpret the data gathered from direct observations, or design interventions following functional analyses. Such skills require in-depth knowledge and expertise in applied behaviour analysis, and may not be feasible to be taught in a brief training package (Iwata, Wallace, et al., 2000; Phillips & Mudford, 2008). Because the aim of the current study was geared towards training parents as assistants, it is assumed that a trained applied behaviour analyst will supervise all aspects of a complete functional analysis.

The current study has demonstrated that parents can acquire functional analysis skills after brief training. Additionally, parents can measure their child's problem behaviour using a partial-interval recording method with a high degree of accuracy. Although none of the participants were able to implement the Demand condition with high procedural integrity, the skills learned maintained, and some increased, at a 6-week follow up assessment. Furthermore,

the instructional video alone was not effective enough in improving implementation accuracy, and all of the participants required further performance feedback.

In spite of this, future research should continue examining the effectiveness of instructional videos as a training tool. The cost and time effectiveness of instructional videos could make them an ideal training method in group-type presentations (Collins et al., 2009; Torrence, 1985; Wallace et al., 2004).

Trahan and Worsdell (2011) suggested exposing participants to more than one viewing of the DVD. In the current study, a video log was used to record the number of viewings completed by each participant. All participants watched the instructional video at least once; Participant 3 was able to view it three times. Parents' comments provided information about some limitations of the DVD. Specifically, that it was hard to understand, especially the use of some jargon terms, and that it would have been beneficial to have supplementary written material in a form of a pamphlet. Future research should take these suggestions into account.

Furthermore, subsequent research should assess whether, following training, parents can implement interventions based on functional analyses. Additionally, parent acquisition of other behaviour interventions should continue to be examined.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: Fourth Edition Text Revision.* Washington, DC: American Psychiatric Association.

Arndorfer, R. E., & Miltenberger, R. G. (1993). Functional assessment and treatment of challenging behaviour: A review with implications for early childhood. *Topics in Early Childhood Special Education, 13,* 82-106.

Autism New Zealand Inc. (2010). *Fact Sheet: Autism Spectrum Disorders* [Brochure]. Wellington, New Zealand.

Bailey, A., Le Couteur, A., Gottesman, I., Bolton, P., Simonoff, E., Yuzda, E., & Rutter, M. (1995). Autism as a strongly genetic disorder: Evidence from a British twin Study. *Psychological Medicine, 25,* 63–77.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Barton-Arwood, S. M., Wehby, J. H., Gunter, P. L., & Lane, K. L. (2003). Functional behavior assessment rating scales: Intrarater reliability with students with emotional or behavioral disorders. *Behavioral Disorders, 28,* 386–400.

Bass, R. F. (1987). Computer-assisted observer training. *Journal of Applied Behavior Analysis, 20,* 83-88.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modelling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children, 73,* 264-287.

Ben Chaabane, D. B., Alber-Morgan, S. R., & DeBar, R. M. (2009). The effects of parent implemented PECS training on improvisation of mands by children with autism. *Journal of Applied Behavior Analysis, 42,* 671–678.

Bijou, S. W., Peterson, R. F., & Ault, M. H. (1968). A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. *Journal of Applied Behavior Analysis, 1,* 175-191

Boyd, B. A., & Shaw, E. (2010). Autism in the Classroom: A Group of Students Changing in Population and Presentation. *Preventing School Failure, 54,* 211-219.

Buschbacher, P. W., & Fox, L. (2003). Understanding and intervening with the challenging behavior of young children with Autism Spectrum Disorders. *Language, Speech, & Hearing Services in Schools, 34,* 217–228.

Buzhardt, J., & Heitzman-Powell, L. (2005). Stop blaming the teachers: The role of usability testing in bridging the gap between educators and technology. *Electronic Journal for the Integration of Technology in Education, 4*, 1-19.

Cale, S., Carr, E., Blakeley-Smith, A., & Owen-DeSchryver, J. (2009). Context-based assessment and intervention for problem behavior in children with autism spectrum disorders. *Behavior Modification, 33,* 707-742.

Carr, E. G., & Durand, V. M. (1985). Reducing behaviour problems through functional communication training. *Journal of Applied Behavior Analysis*, *18,* 111-126.

Carr, J. E., & Fox, E. J. (2009). Using Video Technology to Disseminate Behavioral Procedures: A Review of *Functional Analysis: A Guide for Understanding Challenging Behavior* (DVD). *Journal of Applied Behavior Analysis, 42*, 919-923.

Caspi, A., Gorsky, P., & Privman, M. (2005). Viewing comprehension: Students' learning preferences and strategies when studying from video. *Instructional Science*, 33, 31-47.

Catania, C. N., Almeida, D., Liu-Constant, B., & Digennaro Reed, F. D. (2009). Video modeling to train staff to implement discrete-trial instruction. *Journal of Applied Behavior Analysis*, 42, 387-392.

Collins, S., Higbee, T. S., & Salzberg, C. L. (2009). The effects of video modeling on staff implementation of a problem-solving intervention with adults with developmental disabilities. *Journal of Applied Behavior Analysis, 42,* 849-854.

Conroy, M. A., Fox, J. J., Bucklin, A., & Good, W. (1996). An analysis of the reliability and stability of the Motivation Assessment Scale in assessing the challenging behaviors of persons with developmental disabilities. *Education and Training in Mental Retardation and Developmental Disabilities, 31, 243-250.*

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis (2nd ed.).* Upper Saddle River, NJ: Pearson.

Cowart, J.D., Iwata, B. A., & Poynter, H. (1984). Generalization and maintenance in training parents of the mentally retarded. *Applied Research in Mental Retardation, 5,* 233-244.

DiGennaro-Reed, F. D., Codding, R., Catania, C. N., & Maguire, H. (2010). Effects of video modeling on treatment integrity of behavioral interventions. *Journal of Applied Behavior Analysis, 43,* 291-295.

Donkor, F. (2010). The comparative instructional effectiveness of print-based and video-based instructional materials for teaching practical skills at a distance. *International Review of Research in Open and Distance Learning, 11,* 96-115.

Doss, L. S., & Reichle, J. (1991). Replacing excess behavior with an initial communicative repertoire. In J. Reichle, J. York, & J. Sigafoos (Eds.), *Implementing augmentative and alternative communication: Strategies for learners with severe disabilities* (pp. 215–237). Baltimore: Paul H. Brookes.

Dowrick, P. W. (1991). *Practical guide to using video in the behavioural sciences.* New York: Wiley.

Ducharme, J. M., & Fieldman, M. A. (1992). Comparison of staff training strategies to promote generalized teaching skills. *Journal of Applied Behavior Analysis, 25,* 165-179.

Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curriclar revision, and severe behavior problems. *Journal of Applied Behavior Analysis, 24*, 387-397.

English, C. L., & Anderson, C. M. (2004). Effects of familiar versus unfamiliar therapists on responding in the analog functional analysis. *Research in Developmental Disabilities, 25*, 39-55.

Flanagan, S., Adams, H. E., & Forehand, R. (1979). A comparison of four instructional techniques for teaching parents the use of time-out. *Behavior Therapy, 10*, 94-102.

Fombonne, E. (2003). The prevalence of autism. *Journal of American Medical Association, 289*, 87-89.

Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*, 147-185.

Hansford, A., Zilber, I., LaRue, R. H., & Weiss, M. J. (2010). Practical issues in effective behavioral intervention development. *The Behavior Analyst Today, 11*, 59-76.

Horner, R. D. (1980). The effects of an environmental "enrichment" program on the behavior of institutionalised profoundly retarded children. *Journal of Applied Behavior Analysis, 13*, 473-491.

Humm, S. P., Blampied, N. M., & Liberty, K. A. (2005). Effects of parent-administered, home-based, high-probability request sequence on compliance by children with developmental disabilities. *Child & Family Behavior Therapy. 27*, 27-45.

Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1982/1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27*, 197-209. (Reprinted from *Analysis and Intervention in Developmental Disabilities, 2*, 3-20, 1982).

Iwata, B. A., Kahng, S., Wallace, M. D., & Lindberg, J. S. (2000). The functional analysis model of behavioral assessment. In J. Austin & J. E. Carr (Eds.), *Handbook of applied behavior analysis* (pp.61–90). Reno, NV: Context Press.

Iwata, B. A., Vollmer, T. R., & Zarcone, J. H. (1990). The experimental (functional) analysis of behavior disorders: Methodology, applications, and limitations. In A. C. Repp & N. N. Singh (Eds.), *Perspectives in the use of nonaversive and aversive interventions for persons with developmental disabilities* (pp. 301-330). Sycamore, IL: Sycamore.

Iwata, B. A., Wallace, M. D., Kahng, S. W., Lindberg, J. S., Roscoe, E. M., Conners, J., et al. (2000). Skill acquisition in the implementation of functional analysis methodology. *Journal of Applied Behavior Analysis, 33,* 181-194.

Jahr, E. (1998). Current issues in staff training. *Research in Developmental Disabilities, 19,* 73–87.

LaRue, R. H., Lenard, K., Weiss, M. J., Bamond, M., Palmieri, M., Kelley, M. E. (2010). Comparison of traditional and trial-based methodologies for conducting functional analyses. *Research in Developmental Disabilities, 31*, 480-487.

Lennox, D. B., & Miltenberger, R. G. (1989). Conducting a functional assessment of problem behavior in applied settings. *Journal of the Association for Persons with Severe Handicaps, 14,* 304-311.

Lerman, D. C., & Iwata, B. A. (1993). Descriptive and experimental analyses of variables maintaining self-injurious behavior. *Journal of Applied Behavior Analysis, 26,* 293–319.

Machalicek, W., O'Reilly, M. F., Beretvas, N., Sigafoos, J., & Lancioni, G. E. (2007). A review of interventions to reduce challenging behavior in school settings for students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 1,* 229-246.

Macurik, K. M., O'Kane, N. P., Malanga, P., & Reid, D. H. (2008). Video training of support staff in intervention plans for challenging behavior: Comparison with live training. *Behavioral Interventions, 23,* 143–163.

Matson, J. L., Mahan, S., & LoVullo, S. V. (2009). Parent training: A review of methods for children with developmental disabilities. *Research in Developmental Disabilities, 30,* 961-968.

McDonnell, A., Sturmey, P., Oliver, C., Cunningham, J., Hayes, S., Galvin, M., Walshe, C., & Cunningham, C. (2008). The effects of staff training on staff confidence and challenging behaviour in services for people with autism spectrum disorders. *Research in Autism Spectrum Disorders, 2,* 311-319.

Moore, J. W., Edwards, R. P., Sterling-Turner, H. E., Riley, J., DuBard, M., & McGeorge, A. (2002). Teacher acquisition of functional analysis methodology. *Journal of Applied Behavior Analysis, 35,* 73-77.

Moore, J. W., & Fisher, W. W. (2007). The effects of videotape modeling on staff acquisition of functional analysis methodology. *Journal of Applied Behavior Analysis, 40,* 197-202.

Morgan, R. L., & Salzberg, C. L. (1992). Effects of video-assisted training on employment-related social skills of adults with severe mental retardation. *Journal of Applied Behavior Analysis, 25,* 365-383.

Murphy G. H., Beadle-Brown J., Wing L., Gould J., Shah, A., & Holmes N. (2005) Chronicity of challenging behaviours in people with severe intellectual disabilities and/or autism: a total population sample. *Journal of Autism and Developmental Disorders, 35,* 405–18.

Murzynski, N. T., & Bourret, J. C. (2007). Combining video modeling and least-to-most prompting for establishing response chains. *Behavioral interventions, 22,* 145-152.

Neef, N. A., Trachtenberg, S., Loeb, J., & Sterner, K. (1991). Video-based training of respite care providers: An interactional analysis of presentation format. *Journal of Applied Behavior Analysis, 24,* 473-486.

Neitzel, J. (2010). Positive behavior supports for children and youth with autism spectrum disorders. *Preventing School Failure, 54,* 247-255.

Northup, J., Wacker, D., Sasso, G., Steege, M., Cigrand, K., Cook, J., & DeRaad, A. (1991). A brief functional analysis of aggressive and alternative behaviour in an outclinic setting. *Journal of Applied Behavior Analysis, 24,* 509-522.

O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional assessment and program development for problem behavior: A practical handbook*. Pacific Grove, CA: Brooks/Cole Publishing.

O'Reilly, M., Rispoli, M., Davis, T., Machalicek, W., Lang, R., Sigafoos, J., Kang, S., Lancioni, G., Green, V., & Didden, R. (2010). Functional analysis of challenging behavior in children with autism spectrum disorders: A summary of 10 cases. *Research in Autism Spectrum Disorders, 4,* 1-10.

Parsons, M. B., Reid, D. H., & Green, C. W. (1996). Training basic teaching skills to community and institutional support staff for people with severe disabilities: A one-day program. *Research in developmental disabilities, 17,* 467-485.

Pence, S. T., Roscoe, E. M., Bourret, J. C., & Ahearn, W. H. (2009). Relative contributions of three descriptive methods: Implications for behavioral assessment. *Journal of Applied Behavior Analysis, 42,* 425-446.

Phillips, K. J., & Mudford, O. C. (2008). Functional analysis skills training for residential caregivers. *Behavioral Interventions, 23,* 1-12.

Reagon, K. A., & Higbee, T. S. (2009). Parent-implemented script fading to promote play-based verbal initiations in children with autism. *Journal of Applied Behavior Analysis, 42,* 659-664.

Rice, C. (2009). Prevalence of autism spectrum disorders -- Autism and Developmental Disabilities Monitoring Network, United States, 2006. *CDC Morbidity and Mortality Weekly Report (MMWR) Surveillance Summaries, 58,* 1-20.

Rutter, M.L. (2010). Progress in Understanding Autism: 2007-2010. *Journal of Autism and Developmental Disorders, 41,* 395-404.

Sherer, M., Pierce, K.L., Paredes, S., Kisacky, K.L., Ingersoll, B., & Schreibman, L. (2001). Enhancing conversation skills in children with autism via technology: Which is better, "self" or "other" as a model? *Behavior Modification, 25,* 140-158.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions, 4,* 165-175.

Sigafoos, J., & Saggers, E. (1995). A discrete-trial approach to the functional analysis of aggressive behaviour in two boys with autism. *Australia & New Zealand Journal of Developmental Disabilities, 20,* 287–297.

Skinner, J. N., Veerkamp, M. B., Kamps, D. M., & Andra, P. R. (2009). Teacher and Peer Participation in Functional Analysis and Intervention for a First Grade Student with Attention Deficit Hyperactivity Disorder. *Education and Treatment of Children, 32,* 243-266.

Sloman, K. N. (2010). Research trends in descriptive analysis. *Behavior Analyst Today, 11,* 20-35.

Steyaert, J. G., & De La Marche, W. (2008). What's new in autism? *European Journal of Paediatrics, 167,* 1091-1101

Stokes, J. V., & Luiselli, J. K. (2008). In-home parent training of functional analysis skills. *International Journal of Behavioral Consultation and Therapy, 4,* 259-263.

Szatmari, P. (2003). The causes of autism spectrum disorders. *British Medical Journal, 326,* 173-174.

Thompson, R. H., & Iwata, B. A. (2007). A comparison of outcomes from descriptive and functional analyses of problem behavior. *Journal of Applied Behavior Analysis, 40,* 333-338.

Torrence, D. R. (1985). How Video Can Help. *Training and Development Journal, 39,* 50-51.

Touchette, P. E., MacDonald, R. F., & Langer, S. N. (1985). A scatter plot for identifying stimulus control of problem behavior. *Journal of Applied Behavior Analysis, 18,* 343-351.

Trahan, M. A., & Worsdell, A. S. (2011). Effectiveness of an instructional DVD in training college students to implement functional analyses. *Behavioral Interventions, 26,* 85-102.

Volkmar, F. R., Lord, C., Bailey, A., Schultz, R. T., & Klin, A. (2004). Autism and pervasive developmental disorders. *Journal of Child Psychology and Psychiatry, 45,* 135-170.

Wallace, M. D., Doney, J., Mintz-Resudek, C. M., & Tarbox, R. S. F. (2004). Training educators to implement functional analyses. *Journal of Applied Behavior Analysis, 37,* 89-92.

Wilkinson, W.K., Parrish, J. M., & Wilson, F. E. (1994). Training parents to observe and record: a data-based outcome evaluation of a pilot curriculum. *Research in Developmental Disabilities, 15,* 343-354.

Zarcone, J. R., Rodgers, T. A., Iwata, B. A., Rourke, D. A., & Dorsey, M. F. (1991). Reliability analysis of the motivation assessment scale: A failure to replicate. *Research in Developmental Disabilities, 12,* 349-360.

Appendix A: Advertisement

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

My name is Tatiana and I am a Masters student at the University of Canterbury. As part of my studies I'm teaching parents how to carry out a Functional Analysis on their child. I have made a video to help in this and I will be there to work with you throughout the programme. The aim of a Functional Analysis is to help identify possible environmental situations that may be affecting problem behaviours.

I am looking for people to be involved in the study. If you have a child younger than 13 years, who is diagnosed with ASD and who displays problem behaviour(s) I'd like to hear from you. If you are interested and wish to talk more about what you will gain from my programme please contact me on:

(xx) xxx (between 10am and 4 pm) or xxx (anytime)

or send an email to: xxx

Appendix B: Information Sheet

College of Science

Department of Psychology
Tel: +64 3 364 2902, Fax: +64 3 364 2181
Email: psychology@canterbury.ac.nz, www.psyc.canterbury.ac.nz

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

PARTICIPANT INFORMATION SHEET

Dear Sir/Madam,

I would like to invite you and your child to be involved in the research that I will be doing as a requirement for the degree of Masters of Arts (Psychology) under the supervision of Associate Professor Neville Blampied and Lawrence Walker. This project will evaluate the effects that an instructional video and feedback have on helping you learn about functional analysis procedures.

Functional analysis is a process which identifies possible environmental factors that may cause and maintain problem behaviours. Identifying such variables can help create and structure ways to reduce problem behaviours. As a participant in this project you will be given an instructional video to watch, which will show you how to correctly carry out a functional analysis. The video will also show you how you can record your child's behaviour using partial-interval recording method.

In order to see if the training video has been effective, we will record sessions in which you practice the functional analysis skills. These recorded sessions will also be used to in order for you and me to record your child's behaviour. All of the training and assessment will be carried out in your homes. There will be a maximum of 20 sessions with each session lasting 5 minutes. My copies of your recorded session will be destroyed once the project is completed. However, raw data gathered from those videos will be kept in the University of Canterbury's Department of Psychology for maximum of 7 years, depending on the requirement for publication.

During the sessions, you and your child may be exposed to some risks. These include possible emotional distress and/or increase in your child's problem behaviour. If you or your child shows any signs of distress, sessions will be immediately stopped.

The project should take approximately 6-8 weeks to complete, with a possible follow-up assessment at 6 weeks after training has been concluded. You have the right to withdraw your child and yourself and withdraw any information you have provided from the project before the data analysis phase of the project begins.

The results of the study will be published in my thesis. In addition, if within 6 months after the conclusion of the project I have not published the data in a peer-reviewed journal, or other academic publications, the supervisors will have the right to take over the data and publish it. However, your privacy and identity will be respected and protected. Please note that the Masters Thesis is a public document via the University of Canterbury Library database. Participants' names and other identifying information will not be published; data gathered will be kept protected, and will only be available to be viewed by yourself and the researchers.

At the end of the project you will be given a $20 voucher as an appreciation for your participation in the research. Additionally, you will receive information about possible environmental variables that might maintain your child's problem behaviour and, possible interventions that may help reduce the problem behaviour could be discussed.

The project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

If you have any further questions or comments, please feel free to contact either myself or my two supervisors.

Regards,
Tatiana Li

Tatiana Li	xxx	xxx
Neville Blampied	xxx	xxx
Lawrence Walker	xxx	xxx

University of Canterbury Human Ethics Committe:

Lynda Griffioen (Secretery)	xxx	xxx

Appendix C: Consent Form

College of Science

Department of Psychology
Tel: +64 3 364 2902, Fax: +64 3 364 2181
Email: psychology@canterbury.ac.nz, www.psyc.canterbury.ac.nz

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Tatiana Li
xxx

CONSENT FORM

Effects of video technology on parent-implemented functional analysis

I have read and understood the information given to me about the above-named project. On this basis I agree for me and my child to participate as a participant and subject, respectively, in this project. I give consent to the publication of the project's results, and understand that anonymity will be preserved. I am also aware that a Masters Thesis is a public document via the University of Canterbury Library database.
I also give consent regarding the video recording of me and my child, and I am aware that these video recordings will be destroyed once the project ends. I also understand that all other data (e.g. raw observation data) will be kept in the University of Canterbury's Department of Psychology for maximum of 7 years, depending on the requirement for publication.
I understand that I can withdraw from the project and withdraw any information I have provided before the data analysis phase of the project begins
I note that the project has been reviewed ***and approved*** by the University of Canterbury Human Ethics Committee.
NAME (please print): ……
CHILD'S NAME (please print): …….
Signature:
Date:

Appendix D: Function Assessment Interview Form

Functional Assessment Interview Form

Person of concern _____ Age _____ Sex M F
Date of interview_____ Interviewer _____
Respondents _____

1. Describe the behaviour (s) of concern (how it is performed, how often it occurs, how long it lasts, how damaging/destructive the behaviour is when it occurs)

2. Is there any way that you can tell when the behaviour of concern is about to start

ANTECEDENTS	BEHAVIOUR	CONSEQUENCES

4. How do you feel when the behaviour of concern occurs (i.e. what emotions do you experience)

5. How do you think your child feels when the behaviour occurs (i.e. what emotions does he show during and after an episode of problem behaviour)

6. What are some other appropriate behaviour(s) that the person might use in order to get the same consequence? (Which of these does the person already know how to do?)

7. a) What are some things your child likes and are reinforcing for him/her

b) What are some things that your child dislikes

Notes/Comments

Appendix E: Correct parents' responding checklist

Condition: ALONE

Antecedent	Correct Responding	Definition
(1) Start of session	**(A)** Removal of stimulating material	Material that may serve as a source of stimulation for the child must be removed from the room
	(B) Child is placed alone in the room	No other person is present

Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			
Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			

Condition: ATTENTION

Antecedent	Correct Responding	Definition
(1) Start of session	**(A)** Availability of leisure items	Free access to leisure items and toys
	(B) Instruction given	Initial instruction is given (e.g. "Play with the toys while I do some work")
	(C) Move away	Parent moves away from the child and pretends to be busy (e.g. Reading a magazine)
(2) Target Behaviour	**(D)** Reprimand/Concern	Statement of concern and/or reprimand is given (e.g. "Please stop that, you will hurt yourself")
	(E) Physical Contact	Brief physical contact is displayed (e.g. Response block or hand on child's shoulder)
(3) Other Behaviour	**(F)** Ignore	All other behaviour exhibited by the child is ignored

Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			
Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			

Condition: PLAY

Antecedent	Correct Responding	Definition
(1) Start of session	**(A)** Access to leisure materials	Free access to leisure items and toys
	(B) Absence of demands	No demands are placed on the child by the parent
(2) Approximately every 30sec	**(C)** Non-contingent Attention	Frequent attention is given to the child (at least every 30 sec). Could be either a social praise (e.g. "Wow, you are playing very nicely") or brief physical contact (e.g. Hand on shoulder)
(3) Target Behaviour	**(D)** Ignore	Occurrence of target behaviour is ignored
(4) Appropriate behaviour	**(E)** Attention	Attention is given contingent upon occurrence of appropriate behaviour (e.g. Asking for help)
(5) Inappropriate behaviour	**(F)** Ignore	Inappropriate behaviour that is not the target behaviour is ignored

Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			
Interval #																			
Antecedent #																			
Response #																			
Correct/Incorrect Responding																			

Condition: DEMAND

Antecedent	Correct Responding	Definition
(1) Start of session	**(A)** Task stimuli are presented in front of the child	The task stimuli are placed where the child can see and reach them
(2) Presentation of task	**(B)** Verbal Instruction	Initial verbal task instruction is given (e.g. "Do the puzzle")
(3) Noncompliance to verbal instruction	**(C)** Verbal instruction + model prompt	If the child has not responded to verbal prompt after 5 sec, instruction is repeated coupled with a model prompt of child's correct response
(4) Noncompliance to model prompt	**(D)** Verbal instruction + physical prompt	If the child has not responded to model prompt after 5 sec, instruction is repeated coupled with physical guidance to complete child's correct response
(5) Correct task responding	**(E)** Social praise + next task	When task is completed (either alone or with physical prompt), social praise is given and next task is introduced
(6) Target Behaviour	**(F)** Trial termination	Trial is terminated for 30 sec contingent upon occurrence of target behaviour
(7) Other Behaviour	**(G)** Ignore	All other behaviour that is exhibited by the child is ignored

Interval #																				
Antecedent #																				
Response #																				
Correct/Incorrect Responding																				
Interval #																				
Antecedent #																				
Response #																				
Correct/Incorrect Responding																				

Appendix F: Satisfaction Questionnaire

SATISFACTION SURVEY

1= Strongly Agree; 2= Agree; 3= Neutral; 4= Disagree; 5= Strongly Disagree

Instructional video

1. The content of the video was well structured

   1 2 3 4 5

2. The model was easy to relate to

   1 2 3 4 5

3. The video was easy to follow

   1 2 3 4 5

4. The information provided in the video was thorough

   1 2 3 4 5

5. The instructional video was interactive

   1 2 3 4 5

Feedback training

1. The feedback I received was constructive

   1 2 3 4 5

2. The feedback on my performance helped my learning

   1 2 3 4 5

3. The instructor showed knowledge and professionalism when providing feedback

   1 2 3 4 5

Overall Satisfaction

1. Overall training time was neither too short or too long

   1 2 3 4 5

2. I would use the skills learned again with my child if necessary

   1 2 3 4 5

3. The information gained through training helped me to better understand my child

   1 2 3 4 5

4. I would recommend learning about functional analysis to other parents

   1 2 3 4 5

5. Overall, the training is cost-effective

   1 2 3 4 5

6. I am satisfied with the training programme

   1 2 3 4 5

Further comments or suggestions

Appendix G: Baseline reading material

Condition: ALONE
Subject is placed in the therapy room by themselves. No leisure materials, and other resources that may serve as external source of stimulation, are present.

Condition: ATTENTION
Subject and the experimenter enter the therapy room, where a number of leisure items and toys are available within easy reach of the subject.
Experimenter then instructs the subject to "play with the toys while I do some work", moves across the room and appears busy.
Attention is given to the subject contingent upon every instance of target behaviour. Attention includes statements of concern and/or disapproval (e.g. "Don't do that, you are hurting yourself"), paired with brief non-punitive physical contact (e.g. hand on shoulder).
All other behaviour exhibited by the subject is ignored.

Condition: PLAY (CONTROL)
Experimenter and subject enter the therapy room where a variety of toys and leisure items are available within easy reach of the subject. The subject is allowed to play with the toys and move freely about the room.
During the session, experimenter keeps close proximity to the subject (i.e. within 1m), and periodically presents toys to the subject without making any demands. Social praise and brief physical contact is delivered at least every 30 sec contingent upon appropriate behaviour (e.g. playing appropriately with toys). Inappropriate behaviour and target behaviour is ignored.

Condition: DEMAND
Experimenter and subject enter the room and are seated at a table (if available). Appropriate educational tasks/activities are present. Tasks/activities chosen are those that the subject finds difficult to complete even with a physical prompt.
The experimenter presents learning trials to the subject using a graduated, three-prompt procedure.
Initial verbal prompt is given to the subject, and experimenter waits 5 sec for the subject to respond. If subject fails to respond, then experimenter repeats the verbal instruction, models the correct response, and waits another 5 sec for the subject to respond. If no response is exhibited by the subject, the experimenter then repeats the verbal instruction and physically guides the subject to complete the correct response.
Social praise is delivered when the subject completes the response, despite if the experimenter was required to model or physically prompt the response. The experimenter then begins another trial.
The experimenter immediately terminates the trial, and turns away from the subject for 30 sec, on each occurrence of target behaviour during the session. If subject displays target behaviour during the 30 sec, a further 30 sec is added.

Adapted from Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S (1982/1994). Toward a functional analysis of self-injury. Journal of Applied Behavior Analysis, 27, 197-209. (Reprinted from Analysis and Intervention in Developmental Disabilities, 2, 3-20, 1982).

Appendix H: Instructional DVD

Appendix I: Video view log

Video View LOG

Date/Time	**Chapter viewed** (Whole video, Alone, Attention, Play, Demand, Recording Behaviour)	**Comments** (Write down if there were any disruptions, if you watched alone or with other family members, how many times you watched each chapter, etc)

Appendix J: Knowledge Quiz

QUIZ

The following questions are based on the information given to you in the instructional video. Please answer the following questions as best you can

1) Name two of the four functional analysis conditions?

_____

2) What do you do if the child displays inappropriate behaviour that is not the target behaviour during the functional analysis
   a) Praise the child
   b) Ignore the behaviour
   c) Take away all the leisure items
   d) Walk out of the room

3) During the _____condition, every time the child displays the target behaviour, attention is given

4) How often is attention delivered during the Play condition?
   a) Approximately every 30 seconds
   b) Every time the child displays problem behaviour
   c) Every time the child displays inappropriate behaviour
   d) Never

5) In the Alone condition, what do you do if the child makes his/her way towards you
   a) Give them attention
   b) Shut the door and go to another room
   c) Physically prompt them to stop
   d) Briefly close the door and re-open when the child has moved away

6) During the Demand condition, if the child does not respond to the verbal instruction, you must then repeat the instruction and _____ the correct response. If the child still does not respond, you must then repeat the verbal instruction and ___ _____ the child to complete the correct response.

7) If the child needs a physical prompt to complete the task during the Demand condition, do you praise them?

_____

8) What should you do if the child engages in target behaviour during the Demand condition?
   a) Ignore the behaviour
   b) End the trial and turn away from the child for 30 seconds
   c) Show concern
   d) Praise the child

9) Name one method that is used to record behaviour

_____

10) Using Partial-Interval Recording, when do you record behaviour
   a) Every time the target behaviour occurs
   b) Only if the target behaviour occurs during the whole interval
   c) Only if the target behaviour occurs at the beginning of the interval
   d) When the target behaviour occurs at any time during an interval

Total correct:_____